

REMARKS

Claims 3-14 were determined to be allowable if rewritten in independent form, and the amendments contained herein do so rewrite them. As such, Claims 3-14 should now be allowable. The informality objected to in Claim 4 has also been corrected as suggested in the Office Action.

Newly added Claim 15 also represents the indicated allowable subject matter noted in Claim 3.

Claims 16-18 are newly added and provide an alternative mechanism for identifying the invention disclosed, but are fully supported by the application as filed and add no new matter. Particular support is found in Figure 9 and in the text extending from page 12, line 7, and page 13, line 16.

The Office Action combined *Takahira et al.* (US5220158, hereinafter "*Takahira*") with *Hollenbeck et al.* (US5930304, hereinafter "*Hollenbeck*") to reject Claims 1-2 under 35 U.S.C. § 103. However, the present invention is directed to preventing erroneous demodulation in an IC card that does not include either batteries or external power connections, while *Takahira* is directed to extension of battery life of an IC card that includes batteries. Moreover, presumably because of the solving of different problems, the present invention as claimed includes elements that are not taught, suggested, or motivated by *Takahira*.

An aspect of the present invention is the recognition that: (a) when demodulating ASK (amplitude shift keying) modulated carrier waves, the entire bit duration of a transmitted bit is not needed for demodulation; (b) noise occurring after a bit is demodulated and before the next bit is transmitted can cause an error in demodulation (see Figure 4); and (c) that such errors can be prevented by suspending demodulation for a portion of the bit duration (see Figure 9). Another

aspect is the recognition that this is particularly relevant in regard to a contactless IC card that is powered by an ASK modulated carrier wave from an external source due to the increased likelihood of activity by the IC card causing noise that might cause such errors in demodulation.

In response to such recognition, the claimed invention is directed to preventing erroneous demodulation resulting from inter-bit activity of the IC card where inter-bit activity is activity that occurs after a data bit is demodulated and before the next data bit is to be demodulated. Prevention of erroneous demodulation is accomplished by suspending demodulation during such inter-bit periods, i.e., "during a period within each period corresponding to each bit of the digital data where there is no possibility of a change of a data value in the digital data."

In contrast, *Takahira* does not try to solve the potential problem of erroneous demodulation resulting from inter-bit noise, probably because *Takahira* utilizes an on-card power source in the form of batteries and may be less susceptible to such noise. Although *Takahira* discusses suspension of demodulation, it suspends demodulation only to prevent power usage when the IC card is not in use so as to extend battery life.

A critical difference between the present invention and *Takahira* is when and how long demodulation is suspended. In the present invention demodulation suspension occurs at a high frequency with each suspension lasting less than a bit duration. In *Takahira*, the suspensions, if they occur at all, occur much less frequently and last for a much longer duration. Similarly, demodulation durations will be much longer. Another difference is that the timing and duration of suspensions in the present invention are closely tied to bit durations, whereas in *Takahira* they are not. As timing is so important, preferred embodiments of the present invention actually synchronize a clock signal with the ASK modulated carrier wave, and/or utilize a frequency

divided form of the carrier wave as a clock signal, in order to achieve proper timing of suspensions.

Focusing on the language of Claim 1 as amended herein, *Takahira* does not teach, suggest or motivate the suspension of demodulation during "a period within each period corresponding to each bit of the digital data" where there is no possibility of a change of a data value in the digital data" (i.e., during inter-bit periods that start after initial demodulation of a bit and before initial transmission of the subsequent bit). As such, Claim 1 and the claims depending on Claim 1 are patentable over *Takahira*.

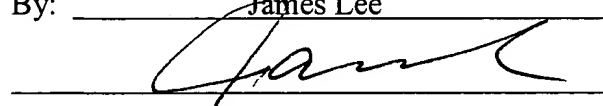
Focusing on the language of added Claim 16, *Takahira* does not teach, suggest or motivate determining and including a suspension unit which "suspends the demodulation by the demodulator circuit during inter-bit periods, wherein each inter-bit period begins after the time at which a data change occurs and ends prior to the time at which the immediately following data change occurs." As such, Claim 16 and the claims depending on Claim 16 are patentable over *Takahira*.

Moreover, the deficiencies of *Takahira* are not eliminated by combining *Takahira* with *Hollenbeck*. As the Office Action points out, *Takahira* does not disclose a carrier wave modulated with data by amplitude shift keying, and asserts that *Hollenbeck* makes up for that deficiency. Regardless of whether that is true, *Hollenbeck* does not teach, suggest, or motivate inter-bit suspension of demodulation as claimed and thus fails to make up *Takahira's* failure to provide such a teaching, suggestion, or motivation. As such, Claims 1 and 16 and the claims dependent on them are all allowable over *Takahira* and *Hollenbeck*.

It is believed that the case is now in condition for allowance, and an early notification of the same is requested. If the Examiner believes that a telephone interview will help further the

prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

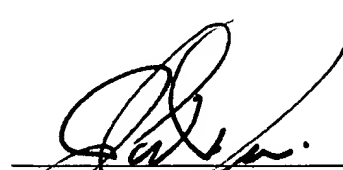
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By: James Lee

Signature

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Very truly yours,

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